

Rocks and Minerals Answer Key – Cobra Invitational 2017

Examination Structure

- 15 sections with 5 questions each (75 points + 8 Extra Credit points = 83 possible points)
 - 8 minerals (minerals each include an Extra Credit question for a total of 6 points)
 - 4 rocks
 - 3 concepts
- Tiebreaker 1: 5 additional, more difficult questions
- Tiebreaker 2: list silicates without using binder
- Response Sheet (for students)
- Answer Key (for scorers)
 - With alternative acceptable answers noted, where appropriate
 - Spelling counts

+++++

Minerals: Corundum, Aragonite, Sodalite, Albite, Celestite, Apatite, Sulfur, Lepidolite

Rocks: Gneiss, Andesite, Oolitic Limestone, Pumice

Concepts: Rock Cycle, Bowen's Reaction Series, Formation of Rocks

+++++

Scoring Instructions:

- One point per correct answer.
- For multiple-choice questions, no credit given unless response exactly matches all answers in this key.
- Spelling counts! No credit given if a word is incorrectly spelled. Use this answer key as reference.
 - Any spelling mistake invalidates the entire answer. For example, in question 1.6, "Aluminum and Oxyegene" is incorrect though only one word is misspelled.
- For Moh's numbers, the response must exactly match the number or range given in the answer key.
 - For question 1.2, "9.1" is NOT an acceptable answer. Corundum is a "marker mineral" with a Moh's number of EXACTLY 9.0.
 - For question 3.2, "3.1" would be an acceptable answer. As noted on the answer key, the Moh's number ranges between 3.0 and 3.5.

+++++

- 1.1 Corundum (ruby or sapphire also acceptable)
- 1.2 Moh's number is 9
- 1.3 Students must indicate both A and D
- 1.4 Students must indicate both A and B
- 1.5 Students must indicate only C
- 1.6 Students must indicate both Aluminum and Oxygen ("Aluminium" is acceptable alternate spelling)

- 2.1 Aragonite (calcite not acceptable)
- 2.2 Moh's number is 3.5 to 4.0 (any number in this range is acceptable)
- 2.3 Students must indicate both B and C
- 2.4 Students must indicate only A
- 2.5 Students must indicate A, B, and C
- 2.6 Students must indicate calcium, carbon, and oxygen

- 3.1 Sodalite
- 3.2 Moh's number is 5.5 to 6.0 (any number in this range is acceptable)
- 3.3 Students must indicate A, B, and C
- 3.4 Students must indicate only C
- 3.5 Students must indicate both A and D
- 3.6 Sulfur (eggs or rotten eggs also acceptable)

- 4.1 Albite
- 4.2 Moh's number is 6.0 to 6.5 (any number in this range is acceptable)
- 4.3 Students must indicate only D
- 4.4 Students must indicate only A
- 4.5 Plagioclase
- 4.6 Students must indicate both B and C

- 5.1 Celestite (Celestine is acceptable)
- 5.2 Moh's number is 3.0 to 3.5 (any number in this range is acceptable)
- 5.3 Students must indicate both B and D
- 5.4 Students must indicate both A and D
- 5.5 Yes
- 5.6 Red

- 6.1 Apatite (acceptable alternatives are hydroxylapatite, hydroxyapatite, fluorapatite and chlorapatite)
- 6.2 Moh's number is 5
- 6.3 Students must indicate A, B, and C
- 6.4 Students must indicate B and D
- 6.5 Yes
- 6.6 Cat's Eye (similar wording acceptable)

- 7.1 Sulfur
- 7.2 Moh's number is 2

- 7.3 Students must indicate A and C
- 7.4 Students must indicate B and D
- 7.5 Students must indicate B
- 7.6 Smell (similar wording acceptable)

- 8.1 Lepidolite
- 8.2 Moh's number is 2.5 to 3.0 (any number in this range is acceptable)
- 8.3 Students must indicate A, C, and D
- 8.4 Students must indicate D only
- 8.5 Specific gravity ("SG" also acceptable)
- 8.6 Mica ("silicates" also acceptable)

- 9.1 Gneiss
- 9.2 Students must indicate C only
- 9.3 Students must indicate both C and D
- 9.4 Students must indicate both A and D
- 9.5 False

- 10.1 Andesite
- 10.2 Students must indicate A only
- 10.3 Students must indicate D only
- 10.4 Students must indicate both B and C
- 10.5 True

- 11.1 Oolitic limestone (correctly spelled reasonable variations such as "limestone – oolitic" are also acceptable)
- 11.2 Students must indicate B only
- 11.3 Students must indicate B only
- 11.4 Students must indicate B, C and D
- 11.5 Calcite (aragonite is also acceptable)

- 12.1 Pumice
- 12.2 Students must indicate C only
- 12.3 Students must indicate D only
- 12.4 Students must indicate A, B, C and D
- 12.5 False

- 13.1 Students must indicate A, C and D
- 13.2 Students must indicate A and D
- 13.3 Students must indicate A and C
- 13.4 Students must indicate B only
- 13.5 Pumice

- 14.1 Students must indicate C only
- 14.2 Students must indicate B only
- 14.3 Students must indicate B and C
- 14.4 True
- 14.5 False

- 15.1 Students must indicate B only
- 15.2 Students must indicate C only
- 15.3 Students must indicate B only
- 15.4 Students must indicate D only
- 15.5 True

TIEBREAKER – BOWEN'S REACTION SERIES

- T1 Olivine
- T2 Quartz
- T3 Students must indicate C only
- T4 False
- T5 Norman

Tiebreaker #2 – Silicates

NOTE TO SCORER – THERE IS NO NEED TO SCORE THIS TIEBREAKER UNLESS A TIE REMAINS AFTER THE FIRST TIEBREAKER!

The 29 silicate minerals on the official list are (in alphabetical order):

1. Agate/Onyx
2. Albite
3. Almandine
4. Amethyst
5. Augite
6. Beryl
7. Biotite
8. Chalcedony
9. Citrine
10. Crystal
11. Epidote
12. Hornblende
13. Jasper
14. Kaolinite
15. Lepidolite
16. Microcline [Amazonite]
17. Milky Quartz
18. Muscovite
19. Olivine
20. Opal
21. Orthoclase
22. Rhodonite
23. Rose Quartz
24. Sodalite
25. Staurolite
26. Talc
27. Topaz
28. Tourmaline group
29. Tremolite